

growth, and polyols, emulsifiers, and fillers can contribute calories and limit consistency, mouthfeel, and flavor. The product also resists separation of the base cake from the filling, even under stressful environments such as random packout in vertical form fillers.

Additionally, the filling may comprise additional, optional components.

Fully or Partially Saturated Lipid ("Crystallizing Lipid")

A fully or partially saturated lipid ("crystallizing lipid") is included in the lipid-based filling at a level of from about 0.5% to about 35%, preferably from about 1% to about 10%, and more preferably from about 5% to about 10% to facilitate crystallization and setting of the fillings. The crystallizing lipids are solid at room temperature (70°F). Without the crystallizing lipid, the product would either be too dry/crumby or too mushy to maintain proper biscuit alignment. The preferred crystallizing lipid is preferably one which provides for filling stability yet allows for good mouthmelt. Preferred crystallizing lipids include partially or fully hydrogenated vegetable oils, animal fats, solid sucrose polyesters, structured triglycerides, and mixtures thereof.

Most preferred crystallizing lipids are any of the known stabilizers such as, but not limited to, fully or partially hydrogenated rapeseed oil, fully or partially hydrogenated soybean oil, or other fully or partially hydrogenated triglycerides having a high proportion of C₁₈, C₂₀, or C₂₂ fatty acids. (See, for example, U.S. Patent No. 3,597,230 and U.S. Patent No. 3,192,102.) These materials can be mixed with a second lipid having an iodine value of less than 8, for example fully or partially hydrogenated palm oil, fully or partially hydrogenated canola oil, fully or partially hydrogenated soybean oil, fully or partially hydrogenated cottonseed oil, fully or partially hydrogenated coconut oil, and similar materials. This stabilizer can also be mixed with lower melting fat fractions such as, for example, the peanut butter stabilizer composition disclosed in U.S. Pat. No. 4,341,814 (1982).

Most other sandwich biscuits achieve adhesion via a triglyceride fat that has a specific melt profile. Usually, the fat contains a high amount of solids below about 80°F and little to no solids above 100°F. The product is sandwiched from about 70°F to about 80°F and the fat is substantially crystalline at that temperature. After sandwiching, the fat stiffens and binds the two base cakes together. Without being limited by theory, it is believed that this is the result of the fat in the filling assuming a beta prime crystal structure. This is presumably not possible if the fat in the filling is comprised mostly of liquid at ambient temperature, or is shear thinning with little or no crystal memory.

It has been found that, without compromising adhesive properties, a sandwich cracker can be made with a filling comprising from about 20% to about 60%, preferably from about 25% to about 40%, most preferably from about 28% to about 33% lipid that is substantially liquid at room temperature or has little or no crystal memory after shearing. In a preferred embodiment, the added lipid is a commercially available sucrose polyester (olestra) such as Olean™. In a temperature range of from about 65°F to about 130°F, these sucrose polyesters contain about 94% liquid. Above 150°F, it is approximately

100% liquid. Additionally, the 6% solids in the olestra do not form beta prime crystal structures. Upon shearing, it remains thin, even after sitting for several hours. Improved adhesion is achieved by blending a crystallizing lipid into the filling. The product is sandwiched in a temperature range that allows the crystallizing lipid to be fully or partially melted. When the crystallizing lipid stiffens, it then binds the base cakes together when used to make a sandwich biscuit product.

In an alternate embodiment, mixtures of sucrose polyester and one or more other fats is used as the crystallizing lipid component of the lipid-based filling.

Optional Ingredients

The filling can contain other suitable ingredients depending upon the flavor or other properties desired. As used herein, "optional ingredients" refers to one or a mixture of more than one of these other suitable ingredients. Non-limiting examples of suitable optional ingredients are set forth below.

The lipid-based fillings of this invention can contain a flavoring and, in most embodiments, at least one other component in addition to the flavoring and the fat components. For example, sandwich cracker fillers typically contain salt. Sandwich cookie fillers typically contain a sweetener; indeed, in sweet creams, the major ingredients are sweetener and fat. The sweetener can be a natural sweetener such as sugar, primarily sucrose, glucose, fructose, and maltose, or any one of known artificial sweeteners including 1-aspartyl-1-phenylalanine methyl ester (commercially available as aspartame or Nutri-Sweet TM), saccharine, cyclamate and the potassium salt of 6-methyl-3,4-dihydro-1,2,3-oxathiazin-4-one-2,2-dioxide (commercially available as acesulfame-K), or a mixture of these.

The filling compositions of the present invention can also contain other ingredients depending upon the flavor or other properties desired. For instance, milk or milk powders or solids (preferably nonfat) can be included, as can eggs, gelatin, cornstarch or other starch such as potato or rice, fruits and nuts, vegetable, cheese and meat pieces, colorings, and lecithin or other emulsifiers. Compositions containing artificial sweeteners substantially sweeter than sucrose typically contain a bulking agent such as polydextrose, isomalt, isomaltulose, polyglucose, polymaltose, carboxymethyl-cellulose, microcrystalline cellulose, cellulose gel, arabinogalactan, as well as mixtures or combinations of any of these. These agents can be included in amounts readily determinable by the skilled artisan.

An emulsifier can be used in the present invention. The emulsifier can be any food compatible emulsifier such as mono- and di-glycerides, lecithin, sucrose monoesters, polyglycerol esters ("PGE"), sorbitan esters, polyethoxylated glycerols, and mixtures thereof. Typically, up to about 3%, preferably from about 1% to about 3%, stabilizer or emulsifier can be used.

The filling compositions can also optionally comprise flavorants. "Flavorants," as the term is used herein, are agents which contribute to or enhance the flavor of the nut

butter. These include sweeteners, flavor enhancers, artificial sweeteners, natural and artificial flavors, flavored or candied bits, nut chunks and other additives which contribute to the flavor of the filling. Sweeteners are selected from the group consisting of sugars, sugar mixtures, artificial sweeteners and other naturally sweet materials. Sugars include, for example, sucrose, fructose, dextrose, honey, molasses, high fructose corn syrup, lactose, maltose, and maltose syrups. Preferably, the sweetener will be something which has a sweetness intensity about that of sucrose or fructose. Sweeteners can be added at a level of about 5% to about 20 %, preferably from about 7% to about 12%.

Artificial sweeteners such as aspartame, acesulfam, saccharine, cyclamate, and glycyrrhizin can also be used. The amount of artificial sweetener used should be that amount effective to produce the sweetness that is desired, and would be about the equivalent of the addition of from about 1% to about 7% of sucrose.

Flavor enhancers including salt, or salt substitutes such as potassium chloride, sodium chloride/potassium chloride mixtures, and seasoned salts can also be used. The level of flavor enhancer used is a matter of the desired taste level, but usually is from about 0.1% to about 2%. Other flavorants include natural or artificial flavors, roasted flavors, and praline/caramel flavors, walnut flavors, almond flavors, and flavor compositions.

The present invention can also employ nut chunks and other flavored additives which can be mixed with the filling. These additives include chocolate chips or bits or other flavored bits (e.g., butterscotch and peanuts), jellies (either low calorie jellies or regular jelly or preserves), and praline nuts or other candies. These additives are usually added at a level of from about 1% to about 20% by weight. Nut chunks and flavored bits can contain fats and oils. Thus, the addition of these materials can affect the fat content and the calorie level of the nut spread.

A bulking agent can be included in filling composition. Bulking agents typically add body or texture to the filling and can be non-nutritive or low calorie materials. Suitable bulking agents include hydrolyzed starch (e.g., corn syrup solids or maltodextrin), dextrose, polydextrose, mono- and disaccharides, starches (e.g., corn, potato, tapioca wheat), as well as mixtures thereof. Corn syrup solids, polydextrose (such as that available from Pfizer Chemicals) and maltodextrin are preferred bulking agents. Sugar substitutes which function like sugars but which are non-nutritive can also be used. Such sugar substitutes include the 5-C-hydroxyalkylaldohexoses described in U.S. Pat. No. 5,041,541, issued August 20, 1991 to Mazur.

The filling can also be fortified with vitamins and/or minerals. These can include, but are not limited to, Vitamin A, Vitamin D, Vitamin K, Vitamin C, Vitamin E, thiamin, riboflavin, niacin, Vitamin B-6, Vitamin B-12, biotin, pantothenic acid, iron, calcium, niacin, magnesium, and mixtures thereof.

Sterols or sterol esters can also be incorporated into the filling of the present invention. Suitable sterol and sterol ester compositions are described in U.S. Patent No. 3,751,569, issued August 7, 1973 to Erickson; U.S. Patent No. 5,244,887, issued